

**CUSTOMER NO. 46850**

**PATENT**

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Re: Attorney Docket No. Greywall 34

In re application of: Dennis S. Greywall

Serial No.: 10/789,074

Group Art Unit: 1791

Filed: 02/27/2004

Examiner: Lazorcik, Jason L.

Matter No.: 990.0626

Phone No.: 571-272-2217

For: Carbon Particle Fiber Assembly Technique

**REPLY BRIEF (37 CFR 41.41)**

Mail Stop Reply Brief - Patents  
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**ATTENTION:** Board of Patent Appeals and Interferences

In response to the Examiner's Answer dated 05/13/2008, the Appellant submits this Reply Brief in support of the pending appeal. The purpose of this Reply Brief is to challenge certain technical arguments and conclusions made by the Examiner in the Examiner's Answer.

### **Roeder does not teach formation of carbon fibers from carbon particles**

The method defined in claim 1 recites the step of “drawing glass ... so as **to form** at least one carbon fiber **from** ... **carbon particles**.”

On page 16 of the Examiner's Answer, the Examiner stated that:

even accepting Applicants chosen definition of “a particle,” it is in no manner evident that, absent any compelling evidence to the contrary, the prior art filament would not meet every requirement of said definition. Specifically, it would appear to the examiner that, absent any compelling evidence to the contrary, the prior art filament may appropriately be construed at least as minute quantity or fragment.

Thus, the Examiner essentially considers Roeder’s “filaments” to be an example of “carbon particles” recited in claim 1.

First, the Appellant directs the Board’s attention to the fact that Roeder does not contain an express definition of its “filament.” Thus, in interpreting the meaning of Roeder’s “filament,” deference must be given to the term’s plain meaning and to the functional description of “filaments” contained in Roeder.

As previously pointed out in the Appeal Brief, the plain meaning of the term “filament” conveys an image of a thread or a thin flexible threadlike object that is capable of being spun into yarn. The functional description of Roeder’s “filaments” certainly comports with this image. In particular, at pages 22-23, Roeder explains that “filaments” are produced by loosening a prefabricated fiber consisting of multiple, compacted-together filaments. This process can be viewed as similar to the process of partially untwisting a strand of yarn. The fact that Roeder’s “filaments” lend themselves to such partial untwisting implies that the “filaments” were indeed capable of being spun into yarn. It is also clear that Roeder’s “filaments” are relatively large objects because Roeder describes how the “filaments” can be mechanically grabbed and piled into bundles for loading into the hollow mandrel. Thus, Roeder’s “filaments” appear to be similar to threads that, while having a relatively small diameter, e.g., on the order of several microns (see page 22 of Roeder), also have a relatively large length, e.g., no less than several centimeters.

It is submitted that these characteristics of Roeder’s “filaments” are not at all consistent with those of Appellant’s “particles.” For example, the plain meaning of the term “particle” implies a minute quantity or a relatively small or the smallest discrete portion or amount of the corresponding material. An exemplary “particle” described in Appellant’s specification is a carbon nanotube

molecule. It is known in the art that carbon nanotube molecules have a diameter of several nanometers and a length of no more than about 100 microns. Thus, the dimensions of Roeder's "filaments" are several orders of magnitude larger than the corresponding dimensions of exemplary Appellant's "particles." In addition, Appellant's specification makes it clear that "carbon particles" can be dispersed to form a sol-gel solution (see page 4, lines 8-19). It is known in the art that forming a sol-gel solution requires the use of colloidal or microscopic (e.g., nanoscale) particles because larger particles tend to coagulate and precipitate out of the solution. Clearly, Roeder's "**filaments**" are neither colloidal nor nanoscale and are **too large** to be dispersed to form a sol-gel solution. It is submitted that these facts provide compelling evidence in support of the conclusion that Roeder's "filaments" are different from, and may not be appropriately construed as examples of, "carbon particles" recited in claim 1.

#### **Roeder does not teach dispersing carbon particles to form a sol-gel solution**

Claim 45 recites the step of **dispersing carbon particles** within a form of liquid glass **to form a sol-gel solution**. Claim 10 recites a similar limitation.

On page 18 of the Examiner's Answer, the Examiner stated that:

Roeder teaches (page 14 of English language translation) that the filament bundle "can be impregnated either by a suspension process ... or by the sol-gel method (German Patent No 1941191 ...), wherein the fiber bundle is immersed in a solution of metal alcoholates." It is evident from the foregoing that Roeder in fact does teach a preferred embodiment wherein the individual carbon filaments are immersed or "dispersed" in a sol-gel solution.

For the following reasons, the Appellant submits that this Examiner's statement misrepresents the teachings of Roeder.

First of all, the Appellant directs the Board's attention to the fact that Roeder does not use the term "dispersing" in its description of the operations performed on the fiber bundle. Rather, Roeder uses the term "immersion" and/or derivatives of this latter term.

Despite this fact, the Examiner implies in the above-quoted statement that Roeder's "immersion" of a fiber bundle in a solution of metal alcoholates is somehow similar to Appellant's "dispersing carbon particles." The Appellant submits that this implication is unfounded and improper because **immersing** something in a solution is very **different from dispersing** something

in a solution. More specifically, immersing an object or material in a solution means plunging or dipping the object/material so that it becomes surrounded and/or covered by the solution. In contrast, dispersing something in a solution means distributing that something more or less evenly throughout the solution. With respect to a structurally cohesive object, the term “dispersing” also implies separating the object into relatively small pieces that can be distributed more or less evenly throughout the solution. With respect to a material, the term “dispersing” implies distributing relatively small pieces of that material more or less evenly throughout a solution.

The Appellant submits that Roeder’s fibers and filaments in the fiber bundle are not being dispersed in the solution of metal alcholates or in alcohol, e.g., because they remain structurally intact. Rather, Roeder’s fibers and filaments are simply dipped in the liquid so that they become surrounded or covered by that liquid (see, e.g., Roeder’s page 15, the first full paragraph). It is submitted that such dipping is not and cannot be used as an example of Appellant’s “dispersing,” notwithstanding the Examiner’s contention to the contrary.

#### **Roeder does not teach solidifying the sol-gel solution**

Claim 45 recites the step of **solidifying the sol-gel solution** to form a glass body containing therein said carbon particles. Claim 9 recites a similar limitation.

On page 18 of the Examiner's Answer, the Examiner stated that:

said sol-gel processing technique, by virtue of yielding a glass impregnated filament bundle, is implicitly understood to encompass the claimed step of “solidifying” at least a portion of the sol-gel solution to “form a glass body containing therein said carbon particles.”

For the following reasons, the Appellant submits that this characterization of Roeder is unfounded and improper.

Solidifying a substance means making that substance solid or hard. When the term “solidifying” is used in reference to a solution, it implies a liquid-to-solid transformation or phase transition.

In the method of Roeder, solid glass particles of the glass/alcohol suspension are agitated to infiltrate the fiber bundle (see, e.g., Roeder’s page 15). Thus, Roeder uses a process that is similar to sedimentation, wherein some solid particles are separated out from the suspension by being trapped between individual fibers of the fiber bundle. There is no liquid-to-solid transformation or

phase transition in this process because one already-existing solid (i.e., solid glass particles of the suspension) is aggregated with another already-existing solid (i.e., the fiber bundle). It is therefore submitted that the Examiner mischaracterized the teachings of Roeder and used them improperly to reject claims 9 and 45.

### **Fees**

During the pendency of this application, the Commissioner for Patents is hereby authorized to charge payment of any filing fees for presentation of extra claims under 37 CFR 1.16 and any patent application processing fees under 37 CFR 1.17 or credit any overpayment to **Mendelsohn & Associates, P.C. Deposit Account No. 50-0782.**

The Commissioner for Patents is hereby authorized to treat any concurrent or future reply, requiring a petition for extension of time under 37 CFR § 1.136 for its timely submission, as incorporating a petition for extension of time for the appropriate length of time if not submitted with the reply.

Respectfully submitted,

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